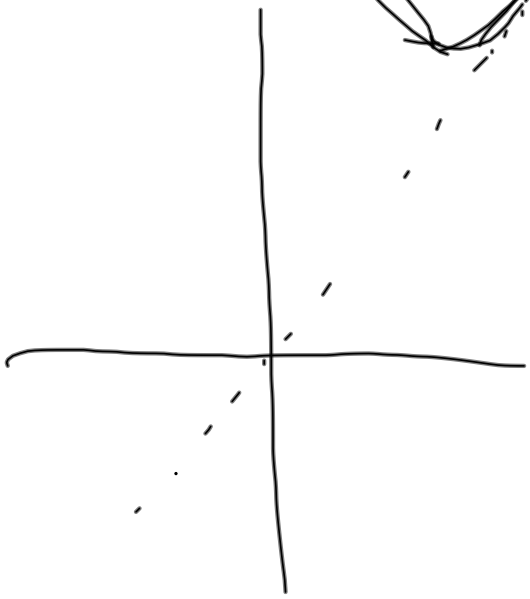
5.3)67

$$y = \frac{x^2 - 2}{x}$$



$$\lim_{x \to \infty} \frac{x^2 - 2}{x} =$$

$$= \lim_{x \to \infty} \frac{x\left(x - \frac{2}{x}\right)}{x} =$$

$$\lim_{x \to \infty} x - \frac{2}{x} = +\infty$$

No horizontal asymptote

66)

$$\frac{P(x)}{Q(x)} = ax+b+\frac{R(x)}{Q(x)}$$

degree $P(x)$ $= 4$

$=$ degree $Q(x)+1$ $\quad (3)$

degree $R(x)$ $< $ degree $Q(x)$ $\quad (3)$

$0, 1, 2$

$$\frac{x^4+\sim}{x^3+\sim}$$

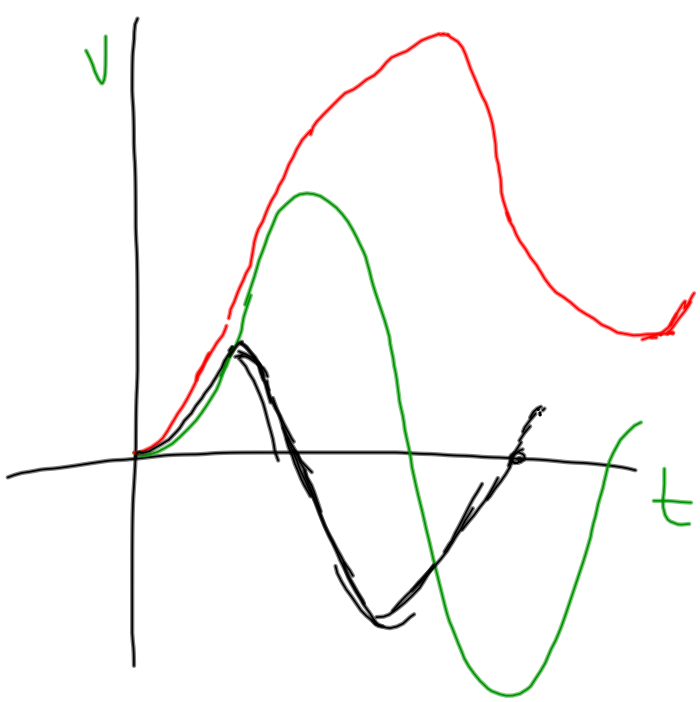
$$\lim_{x\to\infty}\left[\frac{P(x)}{Q(x)}-(ax+b)\right]=0$$

$$=\lim_{x\to\infty}\frac{R(x)}{Q(x)} \quad \frac{2x^2}{2x^3}\sim\frac{1}{2x}$$

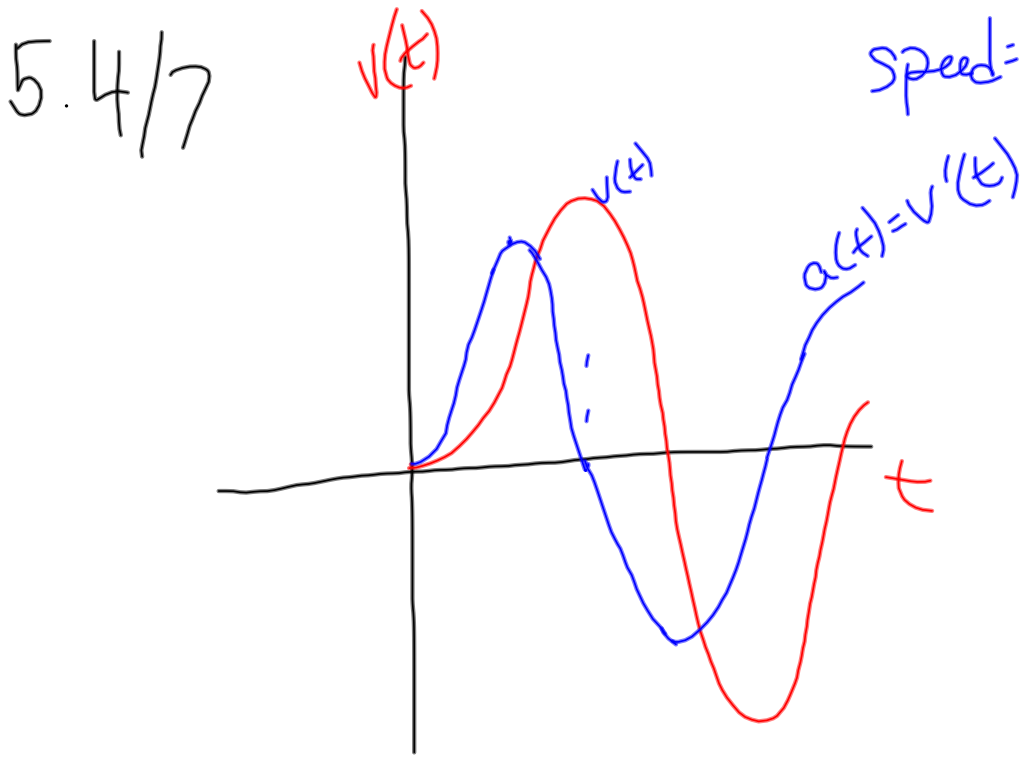
$$\frac{3x^4+2x^3+1}{2x^3-x+1}$$

$$\begin{array}{r|l} & \frac{3}{2}x+1 \\ \hline 2x^3-x+1 & 3x^4+2x^3+1 \\ & -(3x^4-\frac{3}{2}x^2+\frac{3}{2}x) \\ \hline & 2x^3+\frac{3}{2}x^2-\frac{3}{2}x \\ & -(2x^3-x+1) \\ \hline & \frac{3}{2}x^2-\frac{1}{2}x-1 \end{array}$$

5.4/7

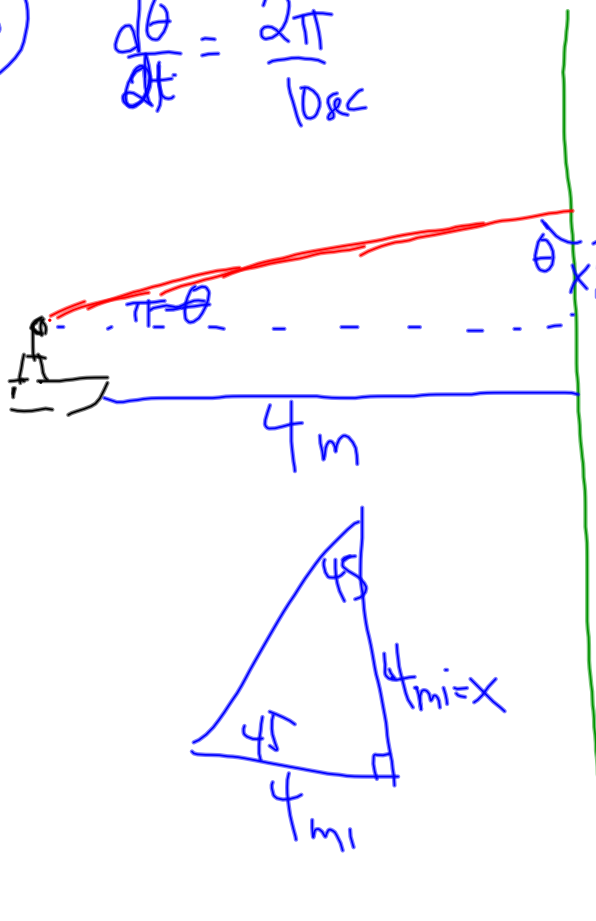


5.4/7



speed = |velocity|

3.7/33) $\frac{d\theta}{dt} = \frac{2\pi}{10\text{sec}}$



$\tan\theta = \frac{4}{x}$

$\sec^2\theta \frac{d\theta}{dt} = \frac{-4}{x^2}\frac{dx}{dt}$

$2\left(\frac{2\pi}{10\text{sec}}\right) = \frac{-4}{(4\text{mi})^2}\frac{dx}{dt}$

$\frac{8\pi\text{mi}}{5\text{sec}} = -\frac{16\pi\text{ mi}}{10\text{sec}} = \frac{dx}{dt}$

$\sec^2 45°$

$\therefore \frac{1}{\cos^2 45°} = \frac{1}{\left(\frac{\sqrt{2}}{2}\right)^2} = 2$

SAND

3.7/28

$r = \frac{1}{2}h$

$\frac{dr}{dt} = \frac{1}{2}\frac{dh}{dt}$

when $h = 8$, $r = 4$

$V = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3}\pi\left(\frac{h^2}{4}\right)h$

$V = \frac{\pi}{12}h^3$

$V = \frac{\pi}{3}(r^2 h)$

$\frac{dV}{dt} = \frac{\pi}{4}h^2\frac{dh}{dt}$

$\frac{dV}{dt} = \frac{\pi}{3}\left[2r\frac{dr}{dt}h + r^2\frac{dh}{dt}\right]$

$10 = \frac{\pi}{3}\left[2(4)\left(\frac{1}{2}\frac{dh}{dt}\right)(8) + (4)^2\frac{dh}{dt}\right]$

$10 \frac{ft^3}{min} = \frac{\pi}{4}(8)^2\frac{dh}{dt}$

$\frac{10}{16\pi}\frac{ft}{min} = \frac{dh}{dt}$